

REPORT DOCUMENTATION PAGE				Form Approved OMB No. 0704-0188	
The public reporting burden for this collection of information is estimated to average 1 hour per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing the burden, to Department of Defense, Washington Headquarters Services, Directorate for Information Operations and Reports (0704-0188), 1215 Jefferson Davis Highway, Suite 1204, Arlington, VA 22202-4302. Respondents should be aware that notwithstanding any other provision of law, no person shall be subject to any penalty for failing to comply with a collection of information if it does not display a currently valid OMB control number.					
PLEASE DO NOT RETURN YOUR FORM TO THE ABOVE ADDRESS.					
1. REPORT DATE (DD-MM-YYYY) 18/Jan/2002		2. REPORT TYPE DISSERTATION		3. DATES COVERED (From - To)	
4. TITLE AND SUBTITLE EXECUTIVE DECISION MAKING UNDER CRISIS				5a. CONTRACT NUMBER	
				5b. GRANT NUMBER	
				5c. PROGRAM ELEMENT NUMBER	
				5d. PROJECT NUMBER	
6. AUTHOR(S) MAJ SAYEGH LISA				5e. TASK NUMBER	
				5f. WORK UNIT NUMBER	
7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES) FLORIDA STATE UNIVERSITY				8. PERFORMING ORGANIZATION REPORT NUMBER CI02-12	
9. SPONSORING/MONITORING AGENCY NAME(S) AND ADDRESS(ES) THE DEPARTMENT OF THE AIR FORCE AFIT/CIA, BLDG 125 2950 P STREET WPAFB OH 45433				10. SPONSOR/MONITOR'S ACRONYM(S)	
				11. SPONSOR/MONITOR'S REPORT NUMBER(S)	
12. DISTRIBUTION/AVAILABILITY STATEMENT Unlimited distribution In Accordance With AFI 35-205/AFIT Sup 1				DISTRIBUTION STATEMENT A: Approved for Public Release - Distribution Unlimited	
13. SUPPLEMENTARY NOTES					
20020204 087					
14. ABSTRACT					
15. SUBJECT TERMS					
16. SECURITY CLASSIFICATION OF:			17. LIMITATION OF ABSTRACT	18. NUMBER OF PAGES 39	19a. NAME OF RESPONSIBLE PERSON
a. REPORT	b. ABSTRACT	c. THIS PAGE			19b. TELEPHONE NUMBER (Include area code)

EXECUTIVE DECISION MAKING UNDER CRISIS

Lisa Sayegh
School of Social Work
Florida State University
Tallahassee, FL 32306-2570
lisasayegh@earthlink.net

William P. Anthony and Pamela L. Perrewé
banthon@cob.fsu.edu pperrew@cob.fsu.edu
College of Business
Florida State University
Tallahassee, FL 32306-1110

EXECUTIVE DECISION MAKING UNDER CRISIS

Abstract

Today's executive manager is increasingly expected to make decisions based on paradigms that depart from traditional rationality and information processing models. This is particularly so under crisis conditions, where there is little time and information available for choice consideration. While the management literature has recently seen more empirical and theoretical support for intuition and tacit knowledge in the decision process, the role of emotion remains absent. This paper advances management decision theory by proposing a conceptual model of executive decision making that underscores the role of emotions in an intuitive decision process under crisis conditions.

EXECUTIVE DECISION MAKING UNDER CRISIS

Consider the enormity of crisis decisions that were required on September 11, 2001 as a result of the airplane hijackings and crashes into the World Trade Center and the Pentagon. Planes in the air were advised to land at the closest airport. Subway trains headed to the Center were halted, thus saving between 3,000 and 5,000 lives (Associated Press Wire, Sept. 19, 2001). Tens of thousands of people were evacuated from the targeted buildings and from those in the surrounding vicinity. After the immediate tragedy, firms were forced to relocate and resume operations. There was a tremendous amount of uncertainty and confusion. These circumstances required fast, but sound, decisions. Managers with crisis-leadership talents are highly valued in these circumstances (Hymowitz, 2001) since there is little time to gather and consider all available information on the situation. Some available information may be accurate, while some may be inaccurate, incomplete or confusing. Much information needed to make a good decision is simply not available. Uncertainty abounds, stakes are very high and there is a very short time frame in which to operate. The decision must also be made within the context of multiple players and organizational and environmental constraints.

Of course, executive managers routinely cope with crisis decision situations, albeit not to the extent as that faced on September 11, 2001. However, in light of the dynamic nature of the global economy and the unpredictable, uncertain nature of today's business environments (Barr, 1998; Clark, Varadarajan, & Pride, 1994; Das & Teng, 1996; Ferris, Perrewé, Anthony, & Gilmore, 2000; Reger & Palmer, 1996), quick decisions under crisis circumstances have become commonplace for many firms. The explosion of the speed and amount of information transfer available through the Internet and other electronic media sources further intensify the scene.

In the midst of these dynamics, the executive somehow is often able to quickly make an effective decision. What are the factors that enable the executive to make the right decision under such critical conditions? The decision literature has identified numerous cognitive mechanisms that appear to guide successful executives toward effective decisions (Dawes, 1979; Hogarth, 1980; Klein, 1983). However, in critical decision situations like the September 11th tragedy, an executive experiences a myriad of both cognitive processes *and intuitive and emotional* reactions that interact instantaneously during the decision process (Kleinmuntz, 1990; Mintzberg, 1976). The roles of tacit knowledge and intuition are appearing with more prominence in the management literature in an attempt to address intuitive decision making processes (Agor, 1990; Brockman & Anthony, 1998; Blattberg & Hoch, 1990; Langley, Mintzberg, Pitcher, Posada, & Saint-Macary, 1995; Kleinmuntz, 1990; Polanyi, 1966). Moreover, findings in neuroscientific research have shown that emotions are not only the basis for thinking, but that good judgment and rational thought are largely dependent on emotional signaling (Bechara, Damasio, Tranel, & Damasio, 1997; Damasio, 1994; Pitcher, 1999).

While much of the focus on the development of decision theory to date has been on the rational, cognitive, and behavioral aspects of decision under normal conditions, the management literature has been virtually silent with respect to developing theory on the emotional aspects of the decision process, particularly under crisis situations germane to the executive manager. This article attempts to fill that gap by proposing a theoretical model that incorporates the roles of emotion and tacit knowledge in intuitive decision making of executives under crisis conditions. We attempt to answer the question: how do emotions and tacit knowledge affect the managerial decision process under crisis conditions? We organize the article by first examining relevant concepts from crisis theory that provide a conceptual basis for the model. Next, we present

recent findings from the biological sciences on the role of emotions in decision making. Then, we present an in depth discussion of the model and its theoretical propositions, including intuitive decision making, and the use of tacit knowledge. We conclude the paper by proposing implications for management practice and future research.

CRISIS THEORY

Defining Crisis

Major concepts of crisis theory supplement those from decision theory to provide a theoretical framework for the proposed model. In this article, we conceptualize a crisis as a decision situation that may equate to an endangerment of the organization's health or survival. Crisis can also be interpreted in a positive light—an opportunity for change and growth, leading to a strengthening of the organization. Thus, crisis is inherently a *decision opportunity* that, despite its potential danger, can lead to constructive growth if managed well. The resulting emotional responses (e.g., fear, excitement, etc.) help the executive to adapt and function effectively through the decision situation.

The semantic roots of the word 'crisis' are instructive and exemplify the dual quality of the phenomenon. The Chinese term for crisis—*weiji*—consists of two characters that signify danger and opportunity occurring simultaneously. The English word for crisis derives from the Greek word *krisis*: "...the point of time when it is decided whether an affair or course of action shall proceed, be modified, or terminate....a *decisive moment* [italics added] where change can be made for the better or worse" (Webster's, 1976: 538). Other aspects of the definition point to the role of emotion in crisis: "...a psychological or social condition characterized by unusual instability caused by excessive stress and either endangering or felt to endanger the continuity of the individual or his group" (p.539). Finally, Golan (1978), a seminal crisis theorist, differentiates crisis from stress by stating that crisis is a growth promoting opportunity and is not

necessarily pathogenic. These definitions, then, illustrate the danger in crisis, yet also allude to its opportunity for change through effective coping and decision making skills.

We define a crisis as a major, unfamiliar, and unusual situation for the executive that requires an immediate decision. It is an unexpected event in that the executive has not had sufficient time to prepare for it. Finally, it is a situation that has the potential to result in major consequences for the organization and/or its members. These characteristics of the crisis definition are discussed below in relation to relevant tenets of crisis theory.

TENETS OF CRISIS THEORY

Perceiving the Crisis Event

According to Golan (1978), one of the major tenets of crisis theory is the individual's perception of the event. During the course of the developing crisis situation, an individual may perceive associated events in various ways. Initial and subsequent events may be perceived as a threat, either to one's physical being or autonomy and well being; as a loss of a person, an ability, or a capacity; or as a challenge to survival, growth, or mastery. How a person perceives the crisis event is determined by numerous existing factors. We argue that whether or not the executive perceives the event as a crisis is significantly influenced by their tacit knowledge and amount of experience (i.e., training and preparedness) s/he has with similar events, as well as their emotional reactions. The more training an executive has in related situations, the more likely s/he will be able to prepare for it's possibility or eventuality. Thus, when a situation arises, the trained and prepared executive may not perceive the event as a crisis and may be better able to cope with it successfully. If an executive is not properly prepared, the situation will more likely be perceived as a crisis and the executive's ability to cope with it is, thus, more uncertain.

Golan (1978) recognized the individual's emotional response to their perception of the event as another main tenet of crisis theory. This concept integrates well with the decision process proposed by Damasio (1994) that identifies the *somatic marker* as the emotional reaction to decision alternatives. Because the feeling is experienced in the body, it is "somatic"; and because it becomes associated with a certain image (i.e., a decision alternative-outcome scenario), it becomes a marker for that image.

If the person perceives the event as a threat, a fear response may be elicited. Such a response may be appropriate and adaptive, given that the response is not so excessive as to immobilize the decision-maker. As mentioned, the fear response may be the somatic marker that will effectively guide the decider away from harmful decision alternatives. If the event is perceived as a challenge, the executive may experience excitement or a productive degree of anxiety that will help to sustain energy resources and reasoning functions throughout the duration of the crisis. These concepts will be discussed in further detail later in the article.

A third concept in crisis theory is the ability to cope. Lazarus, Averill, and Opton (1974) define coping in crisis as: "...problem-solving efforts made by an individual when the demands he faces are highly relevant to his welfare (that is, a situation of considerable jeopardy or promise) and when these demands tax his adaptive resources" (pp. 250-251). They emphasize that adaptive coping involves the need for appraisal of both the threatening condition and the potential avenues for solution and mastery. In the context of this paper, appraising the situation and choosing solution alternatives are conceptualized to be similar to adaptive and intuitive decision making processes. The more the executive experiences successful outcomes and learns from unsuccessful outcomes, the higher the level of mastery s/he will achieve and will thus be able to apply this skill to future decision situations. This is one way tacit knowledge is created

and used. The ultimate result is that the higher the executive's sense of self-efficacy (through mastery), the better the chance for successful decisions.

Finally, Murphy and Moriarty (1976) have described the role of emotions in coping and mastery under crisis. They identify two essential coping strategies for functioning under crisis. One is the individual's capacity to make use of the opportunities, challenges, and resources in him/herself and in the environment, *while effectively utilizing the feelings of pain, frustration, and fear that may attend such difficulties*. Second, the individual must have the capacity to maintain internal integration and resilience to recover after a period of stress. These concepts suggest the importance of acknowledging the emotions attendant in crisis decisions, constructively utilizing them, but avoiding being overcome by them.

As stated in the beginning of the article, we start by assuming that today's executive must increasingly demonstrate the ability to make sound decisions in a fast-paced, uncertain environment. Indeed, recent literature has postulated that top executives in various industries and organizational sectors often perceive their environment as turbulent (McKinley & Scherer, 2000). Thus, executives now must choose decision making strategies that depart from the time- and energy-intensive rational models traditionally taught and used in most management settings (Brockmann & Anthony, 1998). We argue that in decision situations characterized by high stress, ambiguity, and time pressure (i.e., crisis), successful executives adopt a strategy that relies on emotional responses as well as intuitive processes and tacit knowledge.

EMOTIONS IN CRISIS DECISION MAKING

For over 300 years, emotion has been largely banished from the predominant philosophies and theories of decision, reason, and management. Since Descartes wrote, "I think, therefore I am" (Descartes, trans. 1994: 51), cognition has had a stronghold as being the only

legitimized contributor to reason and sound judgment. Conventional teaching has been that “...the less emotion entering into our judgment, and the more objective and rigorous our thinking processes are, the better our decisions will be” (Pitcher, 1999: 30). These traditions were further reinforced in more recent times with the ascendancy of empiricism and positivism espoused in the foundations of scientific management theory (Taylor, 1911). So, too was the case in decision theory developed by economists. Loewenstein (2000) reminds us that when Jeremy Bentham originally proposed the construct of utility in decision making, emotions were a key component in his theory as he viewed utility as the net sum of positive over negative emotions. But later, neoclassical economists disavowed utility’s psychological underpinnings and began to expunge the emotional content from the utility construct. This process resulted in the theory of revealed preference, which interpreted utility as “...an index of preference rather than of happiness” (Loewenstein, 2000: 426). Finally, the management literature on decision making has recently criticized both classical decision theory and Simon’s theories of bounded rationality as still being overly “cerebral” (Langley et al., 1995). These authors make a plea to develop conceptualizations that recognize the intuitive and emotional aspects of the decision-maker. They advocate for viewing the decision maker as an actor and *creator*, an “extrarational man,” who is an evolved form of Simon’s rational man (1957) utilizing abilities outside the provinces of reason and cognition.

Recent findings from the field of neuroscience can be integrated into the theory of management decision making. In his watershed book, *Descartes’ Error* (1994), Damasio, a neuroscientist, discusses the neural underpinnings of emotions and how they contribute to reasoning and decision making. In fact, Damasio asserts that emotions are essential for sound decision making in a social environment. While the association between management and social

decisions may not be immediately apparent to the reader of management literature, Simon (1957, 1978) saw organizational decision making as a problem of social psychology. Also, Laroche (1995) interprets decisions and decision making in organizations as social representations. Recently, researchers have observed that today's organizations are becoming increasingly social in nature, with executives and employees coordinating work efforts in a team-based modality rather than working independently in a rigid hierarchical structure (Ferris, Perrewé, Anthony, & Gilmore, 2000). Finally, Gioia asserts that "...social cognition constitutes the essence of the human experience in organizations" (Gioia, 2001: 345).

The Problem with Rationality

Traditional discussions of decision making have been based on the premise of "high reason" promulgated by philosophical giants, such as Descartes, Plato, and Kant (Popper, 1963). The use of formal logic is believed to result in the best available solution for any problems facing us in any circumstance. Indeed, the classical theory of decision making assumes that the decision-maker possesses—and *invariably uses*—a logical strategy for producing valid inferences upon which an appropriate response option is made. Important to the rationalist conception is that to obtain optimal results; emotions should be kept out of the process. Put another way, emotions only serve to impede good decision making.

Such a neat and clean conception of human decision making is admittedly attractive. Concerning ourselves only with a linear, cognitive process may not seem as "messy" as that which includes emotions. In fact, Damasio (1994) states that the traditional view of rational processing must be "...*unencumbered* [italics added] by passion" (p. 171). This suggests that emotions somehow *weigh down* the decision maker. Respectable accounts of decision theory have, until very recently, chosen not to include emotions in their treatment of cognitive and

decision systems. Emotions were considered elusive (i.e., not easily understood, much less amenable to empirical research methods) and thus unfit to warrant a legitimate position in the quest for understanding “good” judgment processes. The literature largely supports this view: even as late as the 1990’s, cognitive elements including attention, memory, and learning were mentioned. Nary a word is mentioned about the influences of emotions and feelings on the decision process.

The problem is that one cannot extract emotions and feelings from an understanding of the functions of the mind. Clearly emotions play a part in more basic functions, such as feeling fear when escaping a dangerous situation. But this is also true for higher cognitive functions, like decision making (Bechara, Damasio, Tranel, & Damasio, 1997). For example, one especially important decision many people make—the decision to marry—is typically based on love, a very strong emotion. Neuroscientists explain that emotions and feelings arise as a subcortical process in the brain. Because feelings are inextricably tied to the body, they come first in development (before cognition and rationality) and thus retain a primacy that permeates *all* of our mental functioning. Research in the neural processing of decision making reveals that a collection of neural systems dedicated to functions of reasoning and decision making (particularly decisions in personal and social domains) is the same collection of systems involved in emotion and feelings (Damasio, 1994).

Social Decisions

How does this system work? According to Damasio (1994), social decisions are typically complex, have uncertain outcomes, and have a direct impact on survival. As mentioned previously, decision theorists have conceptualized organizational decisions in a social context (Laroche, 1995; Simon, 1978; Walsh, 1995). Therefore, in speaking of a social decision, we can

make a direct analogy to decision situations faced by most executive managers in organizations. The analogy would include survival potential of the company based on the decisions of its executives. These decisions require explicit (i.e., factual) knowledge about the objects, persons, and situations in the external environment, while also being influenced by internal mechanisms responsible for the biological regulation of the decider. Biological regulation involves homeostatic controls, drives, instincts, and the emotions attendant in these mechanisms. Damasio (1994) argues that the processes of emotion and feeling are integral elements of the neural machinery for biological regulation. If biological regulation (i.e., emotion) is essential to guide personal and social behavior (and decisions, by extension), then the most successful brain design is one in which "...the subsystems responsible for reasoning and decision making... [are]... intimately interlocked with those concerned with biological regulation, given their shared involvement in the business of survival" (p. 85).

In other words, biological regulation—emotion—is actually seen as *a part of* decision making. And, contrary to traditional thought demanding the removal of anything but cold rationality, emotion and feeling are essential for decisions that will provide the best chance for survival in social contexts (e.g., Loewenstein, 2000). Given our management analogy, then, executives who incorporate both emotions and reason in their decision processes may have a higher potential to successfully compete for organizational survival.

CONCEPTUAL MODEL OF DECISION MAKING UNDER CRISIS

Our conceptual model of decision making under crisis underscores the importance of emotions and tacit knowledge in the decision process. We propose that emotion not only contributes to good managerial decision making, but it also may be an essential element in the decision processes used in crisis situations.

Emotional Memory

Studies in neuroscientific research have demonstrated how emotions (or lack thereof), rather than rationality, have determined decision quality. Damasio (1994) described a brain-damaged patient, Elliot, whose cognitive functions appeared intact with respect to intellectual tasks, mathematics, etc. However, the damage left Elliot with a flat emotional landscape: cool, dispassionate, and unfazed by his or anybody else's pain, tragedy, or joy. Damasio found that subsequent to the injury, the patient's neural machinery for decision making in personal and social contexts was so flawed that he failed to be a social being in any sense that would be sufficient for survival. He could not learn from disastrous mistakes, and his life quickly eroded to shambles. The findings in Elliot's case led Damasio to hypothesize that memory of emotions (e.g., pain, fear, and anger) aid in decision making. This proposal was fortified by his finding that reported that of 12 patients with similar brain damage, all exhibited a combination of decision making defect and flat emotion and feeling. Their ability to choose advantageously was lost, despite otherwise intact mental capacities.

Additionally, most recent empirical research in neuroscience continues to bolster these concepts. Bechara et al. (1997) found that normal individuals exhibited "nonconscious biases" (i.e., emotion and emotional memory) that guided advantageous decision behavior in a gambling task before conscious knowledge does. These individuals were compared with patients with brain damage similar to those described above. Again, the patients in this study did not exhibit emotional responses and continued to choose disadvantageously *even after they learned the correct strategy*. Like Elliot, even with rationality intact, without emotions, these patients were unable to learn from their mistakes and thus repeatedly made poor decisions. Thus, the non-

conscious biases identified in the Bechara et al. (1997) study appear to comprise emotional memory, which seems to affect emotional responses to a current situation. As can be seen in Figure 1, the decider's emotional response interacts with perception and interpretation of the crisis event, and ultimately the decision process.

Insert Figure 1 about here

In sum, emotions appear to hold a firm and legitimate place in sound decision making. Emotions and feeling are central aspects of biological regulation—they provide the bridge between rational and non-rational processes, which enable the decision-maker to survive in uncertain situations. Emotions do not weigh down the decider, as once believed. Instead, emotions enable and enhance decision processes. They free us up to be responsive, creative, and visionary. Our emotional memory allows us to learn from our mistakes, even when we don't realize it in the current decision moment. As Pitcher (1999) argues, without emotional signals, our thought processes are rigid and we get stuck in the present, unable to learn from the past. The emotion experienced has its own memory and is triggered when similar circumstances arise (Watling, 1998). That is, one experiences an event and the attendant emotion at one point in time. Then, in later years, when faced with a similar situation, the individual may not recall the past situation, but will “remember” the emotion. This emotional memory may guide the decider—by way of a “gut feeling”—to an optimal choice in situations that necessitate quick action, but that do not allow time for recollecting details of past, similar situations and the actions taken in them. An emotional response can enhance the effectiveness of decisions under crisis.

Stable Traits

Stable traits, such as emotional intelligence, have implications for emotional responses that affect the decision process. Emotional intelligence is the ability to regulate one's own as well as others' feelings and emotions (Huy, 1999; Salovey & Mayer, 1990). Emotional intelligence has also been argued to give an individual the ability to discriminate among emotions and to utilize emotional states to solve problems (Salovey & Mayer, 1990). We argue that a higher level of emotional intelligence will result in a more adaptive emotional response.

Additional stable traits related to crisis decision making include locus of control, general self-efficacy, and tolerance for ambiguity. Internal versus external (I-E) control of reinforcement (i.e., locus of control) refers to the degree to which an individual expects that an outcome of their behavior is due to their own behavior or personal characteristics versus the degree to which the outcome is expected to be a function of chance, luck, or fate, under the control of powerful others (e.g., a divine entity or a large governmental organization), or is simply unpredictable (Rotter, 1966). A review of empirical studies showed that I-E differences among individuals are relatively stable across situations (Rotter, 1971).

Locus of control has long been germane to the study of management behavior (Clark et al., 1994; Ford, 1985; Lewin & Stephens, 1994; Trevino, 1986). Clark et al. (1994) found that internals tend to see the world as controllable and they are more willing to grapple with complex and not well defined problems. Moreover, in terms of problem-solving ability, research has found that internals are more likely to engage in innovative behavior (Miller & Toulouse, 1986). Such a tendency may be necessary for successful outcomes in decisions under crisis. For our purposes, we expect internally oriented executives to function more adaptively under crisis situations.

Two other stable traits proposed in the model, general self-efficacy and tolerance for ambiguity have implications for crisis decision making. General self-efficacy simply refers to the executive's sense of confidence about him/herself as a person. Unlike self-efficacy specific to the decision situation, general self-efficacy is how one feels about oneself overall (i.e., across time and situations) and their beliefs in ability to handle difficult situations on the whole.

Tolerance for ambiguity refers to one's comfort level, and consequent functional ability, with unclear, disorganized, situations characterized by incomplete information upon which the executive must make a decision (Cannon-Bowers, Salas, & Pruitt, 1996). Research suggests that successful professionals exhibit a higher tolerance for ambiguity given the ability to quickly recognize salient cues in a turbulent environment (Kaempf, Klein, Thordsen, & Wolf, 1996). Given that personality traits represent a stable predisposition to respond, we argue that these predispositions directly affect the emotional responses to a situation.

Tacit Knowledge in Crisis Decision Making

Tacit knowledge refers to practical knowledge learned informally on the job. Tacit knowledge is that which is neither expressed nor declared openly but rather implied or simply understood; it is often associated with intuition (Wagner, Sujan, Sujan, Rashotte, & Sternberg, 1999). It is knowledge that is accumulated through experience and memories, which are filtered through one's perspectives, beliefs, and values. The decision maker's experience and values interact with knowledge stores that are called upon implicitly and unspoken during a decision situation. Tacit knowledge in decision making is closely related to intuition. Brochmann and Anthony (1998) proposed that the relationship can be viewed as a tacit knowledge inventory: a reservoir of implicit knowledge (gained through experience and memory) that may be accessed, or made explicit through intuitive thought processing.

The use of tacit knowledge and intuitive decision processes and may be the only feasible strategy when the decision-maker is pressed for time or when essential elements of the decision situation are hard to quantify or interpret (Polanyi, 1966). It can also be a viable option when an in-depth analysis is not possible and the decision-maker must move quickly to a plausible solution if a familiar pattern is recognized. Simon also alluded to the concept of tacit knowledge in decision making by arguing that the essence of intuition lies in the organization of knowledge for quick identification. Specifically, intuition and judgement—at least good judgement—are simply analyses frozen into habit and into the capacity for rapid response through recognition” (Simon, 1987: 63).

We believe that under crisis conditions, the executive has insufficient time to abide by the rules of a rational decision process. Using decision aids, calculating utility outcomes, weighing option, choosing preferences are all infeasible courses of action when a decision must be made quickly (Ubel & Loewenstein, 1997). In these cases, the executive who demonstrates intuitive decision making skills and tacit knowledge may have the best chances for success (i.e., to survive, given the evolutionary paradigm proposed by Damasio) (Kaempf, Klein, Thordsen, & Wolf, 1996; Khatri & Ng; 2000).

Khatri and Ng (2000) also point out the value of tacit knowledge (referred to as ‘intuitive synthesis’) in intuitive decision making: “It compresses years of experience and learning in to split seconds...[and] allows calling a number of related problems or issues at the same time” (p. 61). We argue that intuition provides the speed, while tacit knowledge provides the linkages between related experiences in memory. The result is a quick, effective decision for the present situation. The ability to make estimates based on incomplete knowledge is identified by Damasio as a “...index of superior intellectual function” (1994: 42), particularly with respect to

decision making and reasoning in personal and social domains. This is to say that the ability to use tacit knowledge to fill in the gaps in information and knowledge is an indicator of a skill most apt to succeed and survive.

We argue that tacit knowledge is largely a function of the executive's dynamic traits, cognitive factors (i.e., cognitive schema and working memory) and past experience. Each of these areas will be examined. Dynamic traits are traits that may vary given a particular decision situation in a particular point in time. They are factors such as the executive's resilience capacity, self-efficacy and sense of confidence about his/her ability to successfully cope with that specific crisis situation, and political skill (Ferris et al., 2000). We argue that tacit knowledge is more likely to be used in crisis decision making than in non-crisis decisions.

Dynamic Traits

Individual traits can be viewed on a continuum from stable to dynamic (Ghiselli, Campbell, & Zedeck, 1981). Although most researchers consider traits to be stable, some traits are considered to be more dynamic or malleable, such as specific self-efficacy. It is important to distinguish between dynamic traits and stable traits as antecedents. For instance, training can affect a dynamic trait over time, but would not affect a stable trait. Although there are dozens of dynamic traits that might affect tacit knowledge, we focus on those dynamic traits that have been linked specifically with decision making.

One example of an executive's dynamic traits is a capacity for resilience (Golan, 1978). This refers to an individual's ability to cope effectively enough through a crisis situation (i.e., without becoming immobilized) and recover from it to the degree that the event can be integrated in a positive manner. That is, the executive can look back at the event as a learning experience

or an opportunity for growth. Hence, the executive can approach the current crisis with a sense of confidence and optimism.

Specific self-efficacy, or a sense of mastery (Golan, 1978) is another dynamic trait that is proposed to affect the creation and use of tacit knowledge and intuitive decision making. It is the sense of confidence or belief in oneself that the decision maker possesses that allows him or her to believe that s/he can handle the current crisis situation. It is the belief that “I know I’m doing the right thing” that enables the decider to trust his/her hunches, and to act on them (Agor, 1990).

Finally, political skill (Ferris et al., 2000) has also been conceptualized as an essential trait for today’s executive to be successful and is included in our model as another example of an executive’s dynamic trait. Ferris et al. (2000) define political skill as an interpersonal style that combines social astuteness with effective communication skills. Executives with political skill behave in a “...disarmingly charming and engaging manner that inspires confidence, trust, sincerity, and genuineness” (p. 30). Further, these scholars propose that political skill enables the behavioral flexibility necessary in today’s dynamic business environments. Therefore, political skill may improve an executive’s response in a crisis situation, as s/he would be more adaptable and able to disarm personnel, mobilize resources quickly and smoothly, and to do so without creating opposition or resistance.

Cognitive Factors

Cognitive schema and working memory comprise the cognitive factors of the existing traits operating as the executive encounters the crisis event (for a review, see for example, Walsh, 1995). Schema refers to the cognitive structure that retains and organizes an individual’s knowledge (Harris, 1994). Derived from one’s experiences, schemas are conceptualized as subjective theories about how the world operates. Thus, they largely shape a person’s

perception, memory, interpretations of past and present events, and expectations of the future (Markus & Zajonc, 1985). With respect to decision making, schemas also direct information search, acquisition, and processing, thereby largely determining the subsequent decision based on that information (Weick, 1979). Research has found that schema-based sensemaking increases the efficiency and speed of information processing, while helping to fill in insufficient or missing information (Harris, 1994).

Additionally, researchers have found that schema-guided sensemaking can occur unconsciously (i.e., automatic processing) or consciously (e.g., controlled mode) (Gioia & Poole, 1984; Reger & Palmer, 1996). “In...unconscious, automatic processing, schemas drive perception with little conscious intervention, [or] choice...more experience is likely to facilitate more unconscious, tacit processing” (Harris, 1994, p. 315). Although this may seem advantageous to the current argument, a cautionary note is warranted. While schemas help to fill in missing information quickly with tacit knowledge, they may also increase the chance for incorrectly interpreting/perceiving the crisis situation (Weick, 1990). As Reger and Palmer (1996) state, “...as situational uniqueness increases, accurate interpretation becomes more difficult. In unfamiliar environments, automatic category assignments based on outdated maps [i.e., schemas] are likely to result in erroneous action” (p. 26). Despite this danger, empirical findings suggest that strategic executives tend to use automatic processing schemas even during periods of extreme environmental turbulence (Reger & Palmer, 1996). These concepts are vital to apply in crisis situations, where typically little opportunity exists to gather all information that would aid the decision maker. Thus, the quality of the executive’s cognitive schema (i.e., whether it accurately reflects the realities of the current environment) may determine how well s/he is able to adapt, and therefore, successfully deal with the crisis (Barr, 1998).

Working memory, the second cognitive factor in our proposed model, is the meeting place for information and knowledge that the executive has about the crisis event, inferences drawn, and experience with past similar events (Prietula & Simon, 1989). However, working memory has a finite capacity due to limitations on long-term memory access: the executive is capable of recalling only so much knowledge and can attend to only so much information at any given time (Hogarth, 1980; Simon, 1957). The successful executive will be able to overcome these limitations by quickly focusing on only the most relevant information to be put to use in the decision process.

Experience

Experience is also critical in the creation of tacit knowledge and use of intuitive decision making skills. Indeed, there is a growing strand of literature which documents that senior executives routinely make decisions based on tacit knowledge grounded in experience (Agor, 1986, 1990; Guinipero, Dawley, & Anthony, 1999; Kleinmuntz, 1990); and that other experts use intuitive decision strategies almost exclusively under high stress conditions (e.g., the decision making processes of military pilots and commanders) (Kaempf et al., 1996). In the context of decision making in crisis, we argue that relevant experience is composed of exposure to events similar to the current situation, successful outcomes of such past events, training, education, and explicit job knowledge. Experience influences the executive's dynamic traits, working memory, and cognitive schema. These factors, in turn, affect tacit knowledge.

Perception and Interpretation

Perception or interpretation of the event may be the most integral cognitive function of the decision process. It is influenced by all other factors previously discussed. As Barr (1998) states, "...a key component in a firm's strategic response to unfamiliar environmental events is

the interpretation executives develop about the event itself...” (p. 644). The way in which an executive perceives the crisis event—whether as a threat, loss, or challenge (Golan, 1978)—will impact the entire decision process. For example, if the executive views the situation as a threat, defensive or protective decision options may be considered. This concept was dramatically illustrated on September 11, 2001 by a New York Port Authority Trainmaster. Within the first few moments of the first plane hitting the World Trade Center and only sparse, sketchy information available, Trainmaster Richie Moran accurately and intuitively perceived the situation as a threat. He consequently made an instantaneous decision to redirect all trains servicing the WTC. This defensive decision protected the lives of thousands of passengers whose lives would have otherwise been imperiled (Associated Press Wire, Sept. 19, 2001). If the situation is perceived as a challenge, the executive may be open to considering more innovative or unorthodox approaches to address the crisis. Indeed, empirical findings suggest that interpretations of the event as an opportunity result in offensive-type responses, while threats trigger defensive-type responses (Barr, 1998). Still other forms of options (e.g., no response) would be considered if the decider views the event as a loss (Staw, Meckelchick, & Puffer, 1981). Predictability—the degree to which the course of the situation can be anticipated—also influences event interpretation. If the executive believes the situation is predictable, s/he might more likely perceive the situation as a challenge, rather than a threat. If the situation is less predictable (i.e., more turbulent and unfamiliar), the executive’s perceptions and resultant decisions may be affected accordingly (Barr, 1998).

A well-documented concern about event perceptions is that initial interpretations made by executives are rarely questioned. Empirical and theoretical research suggests that most executives do not generate alternative solutions; rather, they tend to adopt familiar options that

are based on experience and previously successful outcomes (Cyert & March, 1963; Ford & Gioia, 2000; Reger & Palmer, 1996). This appears particularly true in considerably uncertain, ambiguous, or crisis-laden decision situations (Barr, 1998; Weick, 1990). Hence, prior knowledge (e.g., tacit knowledge, prior experiences) or awareness of possible alternatives have a significant influence on the final options considered by the executive (Ford & Gioia, 2000). The roles of emotion and tacit knowledge and their effect on event perception, then, become paramount as the executive enters into the actual decision process. As can be seen in Figure 1, the perception and interpretation of an event is dependent upon both tacit knowledge and the emotional reaction to the crisis. Further, perceptions and emotion are reciprocal in nature and jointly affect the decision process. The decider's perception of the crisis event can vary, depending on numerous individual and cognitive factors. How the event is perceived will directly impact the response options analyzed by the executive.

Information Processing and the Decision Process

Based on his/her perception of the crisis event, emotional reaction, and tacit knowledge carried into the decision process, the executive considers an array of feasible decision options appropriate to the situation. This process consists of cognitive processes, such as reasoning ability (Allison, 1971), attention capacity (Damasio, 1994; Hogarth, 1980), and attributions (Ford, 1985; Perrewé & Zellars, 1999). It also consists of extrarational (Langley et al., 1995) processes, such as intuition (Khatri & Ng, 2000). Though an analysis of rational decision processes is not the expressed focus of this paper, a brief mention of some of these concepts is warranted. Following this short discussion, a more in depth analysis of intuitive decision making is presented.

Reasoning ability, typically associated with complex problem solving, consists of gathering information, calling up relevant knowledge (explicit and implicit), making calculated observations about the situation, and proposing alternative solutions (Ford & Gioia, 2000; Prietula & Simon, 1989). Although analytical reasoning requires extensive time and mental capital from the decision maker and may not be the optimal technique in crisis situations, it is still a requisite faculty for effective decision making as a rule (i.e., regardless of the situation). Attention capacity is limited in the decider at any given time (Simon, 1979). An executive must face many issues competing for his/her attention, while simultaneously coping with the crisis event. Attribution, closely related to event perception and attention, refers to decision maker's assignment of possible causes of events and the consequent responses to those events (Perrewé & Zellars, 1999). However, the human element of this "rational" process is observed by Ford (1985), "Causal attributions are influenced by the information to which decision makers attend. Decision makers, however, are not unbiased information processors. They practice confirmatory hypothesis testing through the preferential gathering and analysis of information" (p. 774). Thus, biased perception and attention may impact the attributions and subsequent responses to a particular event. We can therefore see that even rational decision processes can be affected by the decider's emotions. Executive consideration of response options usually follows rational decision rules under normal conditions. In crisis, however, the influence of intuition and tacit knowledge significantly speed up this traditional reasoning process.

The Intuitive Decision Processes and Emotional Response

Findings in the empirical literature further support the value of intuition in organizational decision making. Khatri and Ng (2000) describe intuition as the "...smooth automatic performance of learned behavior sequences and often can short-circuit a step-wise decision

making, thus allowing an individual to know almost instantly what the best course of action is” (pp. 60-61). Their study found intuitive synthesis (defined as a combination of experience, judgment, and ‘gut-feel’) to be an important part of senior executives’ strategic decision making. Moreover, the study showed a significant use of ‘gut-feel’ in strategic decision making in the computer industry, a benchmark for future-oriented business, organization, and industry for the foreseeable future.

Because emotions involve bodily reactions, this somatic experience accounts for the frequently described “gut feeling” about the best decision (Khatry & Ng, 2000). We believe the emotions experienced by the executive at this stage act as the “grease in the wheels” of the decision process, facilitating its smooth and rapid operation. The emotion associated with the event and decision options considered for the event is stored in memory. While the actual event is also remembered, the emotions are remembered in a more primitive section of the brain (Damasio, 1994). Thus, during decision making under crisis, the executive “registers” (i.e., remembers) only the emotion associated with past experiences, while not needing to take the time to recall the details and contexts of the experiences themselves, which may appropriately occur during non-critical decision situations (i.e., traditional decision analyses). This is how the executive can “think through”—and “*feel*” through—many decision options quickly and accurately.

The emotions experienced under conditions of crisis and uncertainty—fear, anxiety, hope, and regret—force the decider to move away from traditional decision making paradigms to alternative models of choice. Time simply does not permit a carefully thought-out rational approach. Emotions seem to have an adaptive function in times of high uncertainty: people tend to minimize past fears, but exaggerate the fear they may experience in the future (Ubel &

Loewenstein, 2000). This phenomenon serves as a dual coping mechanism. It allows the executive to be activated (through the experience of anticipated fear) to effectively deal with the present situation, while not being immobilized from memories of fear or pain resulting from prior negative consequences. Conversely, the emotions associated with prior favorable outcomes allow people to immediately apply the same decision processes to a similar situation in the present.

While Khtari and Ng (2000) agree with the basic mechanisms of intuitive decision making as described above, they disagree with the proposition that emotions play a helpful role in intuitive decision making. They cite several authors who state that intuition is not based on emotions. Although it may be true that excessive emotional upset will impair any decision making or reasoning process, we propose that emotions that are operating in a “normal” range actually *facilitate* decision making. Indeed, Agor (1986) found that executives described the experience of intuitive decision making as a growing excitement in the pit of their stomachs and a burst of enthusiasm and energy. In addition, writers in the arts literature support the assertion that emotions can aid in reasoning through the writings of Suzanne Langer, a noted aesthetician and philosopher of art. Langer (1967) promulgated the notion that rationality can be facilitated by art through its evocation of emotion. Reasoning is connected with emotions in that it involves the process of building up insight into relations that are too complex to be grasped by direct observation. Building on this idea, Watling (1998), explains that art conjoins with rationality through the way that the elements of an artwork help to create insight about feelings into relations, which can be understood only in a non-discursive manner. Langer (1967) concludes that intellect is a specialized and intensive feeling about intuition.

Thus, emotions and emotional responses—even if they are not conscious to the executive in the decision moment—help to give structure and meaning to experiences and situations. This point is particularly salient when the decision maker must quickly make sensible meaning out of a multi-dimensional and uncertain situation. Feelings are like internal guides that point us to the proper direction in a decision making space where we may put the instruments of logic to effective use. When faced with a challenging, and often frightening, task of predicting an uncertain future and deciding actions accordingly, emotions help by acting as sensors that work in concert with memory and recognition to help access tacit or “old knowledge” (Damasio, 1994). If an emotion seems inappropriate to the circumstance, it may signal to the decider that the choice being considered is not the best one. If an emotion associated with another alternative feels “right” to the circumstance, it may signal to the decider that it is the one to choose.

THE RELEVANCE FOR MANAGERS

Imagine the executive facing several alternatives in a critical decision situation. All options’ key components and possible outcomes are vaguely “seen” and simultaneously considered in his or her mind. But before any rational decision analysis occurs, the executive experiences an unpleasant gut feeling when a negative outcome connected with a particular response option fleetingly comes to mind. This gut feeling is what Damasio (1994) calls the “somatic marker,” as described earlier in the article.

According to Damasio (1994), the somatic marker—the emotional response—is the decider’s guide that forces attention on an alternative with a negative outcome and serving as an automated alarm signal. The signal may lead to an immediate rejection of that alternative, thereby protecting the executive from future losses. In contrast, a positive somatic marker (e.g., a feeling of excitement) combined with a possible outcome functions as an incentive. Both

reactions then enable the executive to quickly eliminate some options, retain others, and ultimately choosing *from among fewer alternatives*. Damasio proposes that somatic markers increase the accuracy and efficiency of the decision process. In addition, “regular” cognitive abilities operating in the decision task, such as attention and working memory, are both initially motivated and subsequently sustained through emotion-based preferences. These concepts illustrate the essential and beneficial role emotions play in rapid decision making. They allow for economy of time and energy, which are vital resources of the executive operating in a highly dynamic, uncertain environment.

Somatic markers also directly relate to our current understanding of intuitive decision making and tacit knowledge. These frequently unconscious emotional responses help the decision maker by providing an automated detection system to focus in on only the most relevant components of the decision scenario. It is here that we can see the link between emotion and tacit knowledge. The somatic marker (i.e., the emotional response) works in concert with knowledge stores, guiding the decision-maker through emotional signaling to attend to the most relevant information and to correctly fill in for missing or incorrect information. Moreover, the combination of these two components, information held by the executive and the emotional response to its applicability in a given decision situation, result in that “gut feeling” about the “right” decision—what we commonly refer to as “intuition.”

Our suggestion is that an executive who makes critical decisions that could greatly influence the survival or health of the organization is analogous to a human being making critical decisions that will determine his/her personal survival. Damasio (1994) argues that deciding well means to select a response that will be advantageous to the organism in terms of its survival,

and of the quality of that survival. Deciding well also means deciding in an expeditious manner, especially when time is of the essence.

An advantageous decision refers to adaptive outcomes that result in survival of the individual and its kin, maintenance of shelter, physical and mental health, employment and financial solvency, and good standing in the larger social group. By extension, these outcomes are equally as important and relevant for organizational survival (Laroche, 1995; Simon, 1987). Thus, the decision processes that enable individual survival in personal and social domains are, in many respects, the same decision processes that will lead to organizational survival during critical situations. These reasoning processes appear to be integrally connected with and dependent upon emotions and biological regulation (Bechara et al., 1997; Damasio, 1994). Therefore, emotion is a necessary component for surviving (as a person or an organization) a decision situation under crisis. In this paper, we have attempted to forward the development of decision theory by introducing the role that emotions have in crisis decision making. We argue that emotion is an essential element in decision making under crisis. The outcome associated with an intuitive decision process will not only be incorporated into the executive's experience, but also his emotional memory. Outcomes of intuitive decision processes serve as key components for the development of tacit knowledge, contributing to the executive's ability to respond adaptively during the next decision event.

DISCUSSION AND CONCLUSION

Theories of rationality have come a long way since Descartes proclaimed the superiority of cognition. We now acknowledge that the human mind and the nature of our existence are defined by more than our ability to reason. Other factors of our being, such as visceral (i.e., bodily) functions and emotions, are now seen as integral components of what we call 'self' and

actually contribute to rational tasks heretofore seen as the sole domain of cognition (Damasio, 1994; Loewenstein, 2000). In this article, we expanded the application of these findings by arguing that rationality with respect to managerial and organizational decision making is partly defined through our ability to experience emotions. That is, we argued that an emotional response is a necessary component in a “rational” decision analysis, especially under crisis conditions in organizational settings. Moreover, we proposed that the emotional response might be the key element in executives’ successful utilization of tacit knowledge and intuitive decision making strategies.

We encourage practitioners and educators of management to become cognizant of the role emotions play in rapid decision making. Just as Damasio (1994) asserts that emotions are essential for adaptation and survival in personal and social decisions, fostering intuitive processes—facilitated by emotions—to guide management decisions may be an essential key to survival in today’s dynamic business world. Thus, there appears to be legitimate space for teaching and practicing intuitive-based decision making strategies, particularly with executives (Agor, 1996).

A major component of practicing sound decision making under crisis involves executives increasing their awareness of how they perceive the crisis event. Do they perceive it as a threat, challenge, or loss (Golan, 1978)? How are subsequent decisions influenced by their perception? It may be possible to re-frame (i.e., re-interpret) an event with a more constructive interpretation, if the executive is aware of his/her process.

Management theories and models of decision making should expand its current boundaries to incorporate these concepts. While the contributions of Taylor (1917), Simon (1957), and Tversky (Tversky & Kahneman, 1974, 2000; Tversky & Koehler, 1994) still hold

their rightful place in organizational decision theory, an updated theoretical understanding is needed that will help explain effective decision making in today's fast-paced, turbulent business environments (McKinley & Scherer, 2000). Our model proposes a new way to view the decision making process of executives operating under conditions of high stress, uncertainty, unexpectedness, limited time and information, high stakes, and conflicting goals. We conceptualize this mixture of conditions as a crisis for the organization—a point at which decisions can impact the organization's health and/or survival. We strive to build on existing theoretical frameworks of managerial decision making by focusing not on the linear, cognitive capabilities of the decider (although they are still present and needed), but on the more “human” aspects of the decider, such as their individual traits, cognitive mechanisms, and the important roles of tacit knowledge and emotions. Therefore, we take the next step in our goal for theoretical understanding by arguing that emotions may constitute the “extra” in the “extrarationality” of intuitive decision making using tacit knowledge (Langley et al., 1995; Polanyi, 1966).

REFERENCES

- Agor, W. H. 1986. The logic of intuition: How top executives make important decisions. *Organizational Dynamics*, 14: 5-18.
- Agor, W. H. 1990. *Intuition in organizations: Leading and managing productively*. Newbury Park, CA: Sage Publications.
- The Associated Press. September 19, 2001. Quick response by Port Authority staff averted more casualties. Jersey City, NJ: The Associated Press State and Local Wire. *Lexis-Nexis Academic Universe* [On-line database].
- Allison, G. 1971. *Essence of decision: Explaining the Cuban missile crisis*. Boston, MA: Little, Brown, & Company.
- Barr, P. S. 1998. Adapting to unfamiliar environmental events: A look at the evolution of interpretation and its role in strategic change. *Organization Science*, 9(6): 644-667.
- Bechara, A., Damasio, H., Tranel, D., & Damasio, A. 1997. Deciding advantageously before knowing advantageous strategy. *Science*, 275: 1293-1295.
- Blattberg, R. C., & Hoch, S. J. 1990. Database models and managerial intuition: 50% model + 50% manager. *Management Science*, 36(8): 887-899.
- Brockman, E. N. & Anthony, W. P. 1998. The influence of tacit knowledge and collective mind on strategic planning. *Journal of Managerial Issues*, 10(2): 204-222.
- Cannon-Bowers, J. A., Salas, E., & Pruitt, J. S. 1996. Establishing the boundaries of a paradigm for decision making research. *Human Factors*, 38(2): 193-205.
- Clark, T., Varadarajan, P. R., & Pride, W. M. 1994. Environmental management: The construct and research propositions. *Journal of Business Research*, 29: 23-38.

- Cyert, R. M., & March, J. G. 1963. *A behavioral theory of the firm*. Englewood Cliffs, NJ: Prentice-Hall.
- Damasio, A. R. 1994. *Descartes' error: Emotion, reason, and the human brain*. New York: G.P. Putnam.
- Das, T. K., & Teng, B. 1996. Risk types and interfirm alliance structures. *Academy of Management Proceedings*: 11-15.
- Dawes, R. M. 1979. The robust beauty of improper linear models in decision making. *American Psychologist*, 34(7): 571-582.
- Descartes, R. (1994). *Discourse on the method of conducting one's reason well and of seeking the truth in the sciences* (G. Heffernan, Trans.). Notre Dame: University of Notre Dame Press.
- Ferris, G. R., Perrewé, P. L., Anthony, W.P., & Gilmore, D. C. 2000. Political skill at work. *Organizational Dynamics*, 28(4): 25-37.
- Ford, C. M., & Gioia, D. A. 2000. Factors influencing creativity in the domain of managerial decision making. *Journal of Management*, 26(4): 705-732.
- Ford, J. D. 1985. The effects of causal attributions on decision makers' responses to performance downturns. *Academy of Management Review*, 10(4): 770-786.
- Ghiselli, E.E., Campbell, J.P. and Zedeck, S. *Measurement theory for the behavioral science*, W.H. Freeman, San Francisco, CA, 1981.
- Gioia, D. A. (2001). Commentary: Strategy is social cognition. In T. K. Lant & Z. Shapira (Eds.), *Organizational cognition: Computation and interpretation* (pp. 345-350). Mahwah, NJ: Lawrence Erlbaum Associates.

- Gioia, D. A., & Poole, P. P. 1984. Scripts in organizational behavior. *Academy of Management Review*, 9, 449-459.
- Golan, N. 1978. *Treatment in crisis situations*. New York: Free Press.
- Giunipero, L., Dawley, D., & Anthony, W. P. 1999. The impact of tacit knowledge on purchasing decisions. *The Journal of Supply Chain Management*, 35(1): 42-49.
- Hogarth, R. M. 1980. *Judgement and choice*. New York: Wiley & Sons.
- Hymowitz, Carol, Companies Experience Major Power Shifts As Crises Continue. *Wall Street Journal*, October 9, 2001, p. B1.
- Harris, S. G. 1994. Organizational culture and individual sensemaking: A schema-based perspective. *Organization Science*, 5(3): 309-321.
- Janis, I. L. 1982. Decisionmaking under stress. In L. Goldberger and S. Breznitz (Eds.), *Handbook of stress: Theoretical and clinical aspects*: 69-87. New York: Free Press.
- Kaempf, G. L., Klein, G. A., Thordsen, M. L., & Wolf, S. 1996. Decision making in complex naval command-and-control environments. *Human Factors*, 38(2): 220-231.
- Khatri, N., & Ng, H. A. 2000. The role of intuition in strategic decision making. *Human Relations*, 53(1): 57-86.
- Klein, N. M. 1983. Utility and decision strategies: A second look at the rational decision maker. *Organizational Behavior and Human Performance*, 31(1): 1-25.
- Kleinmuntz, B. 1990. Why we still use our heads instead of formulas: Toward an integrative approach. *Psychological Bulletin*, 107(3): 296-310.
- Langer, S. K. 1967. *Mind: An essay on human feeling* (Vol. 1). Baltimore: Johns Hopkins University Press.

- Langley, A., Mintzberg, H., Pitcher, P., Posada, E., & Saint-Macary, J. 1995. Opening up decision making: The view from the black stool. *Organization Science*, 6(3): 260-279.
- Laroche, H. 1995. From decision to action in organizations: Decision making as a social representation. *Organization Science*, 6(1): 62-75.
- Lazarus, R. S., Averill, J. R., & Opton, E. M. 1974. The psychology of coping: Issues of research and assessment. In G. V. Coelho, Hamburg, D. A., & Adams, J. E. (Eds.), *Coping and adaptation*: 249-315. New York: Basic Books.
- Lazarus, R. S., & Folkman, S. 1984. *Stress, appraisal, and coping*. New York: Springer.
- Loewenstein, G. 2000. Emotions in economic theory and economic behavior. *American Economic Review*, 90(2): 426-432.
- March, J. G. 1978. Bounded rationality, ambiguity, and the engineering of choice. *The Bell Journal of Economics*, 9(2): 587-608.
- Markus, H., & Zajonc, R. B. 1985. The cognitive perspective in social psychology. In G. Lindzey and E. Aronson (Eds.), *The handbook of social psychology* (3rd ed.): 137-230. New York: Random House.
- McKinley, W., & Scherer, A. G. 2000. Some unanticipated consequences of organizational restructuring. *Academy of Management Review*, 25(4): 735-752.
- Miller, D. & Toulouse, J. 1986. Chief executive personality and corporate strategy and structure in small firms. *Management Science*, 32: 1389-1409.
- Mintzberg, H. 1976. Planning on the left side and managing on the right. *Harvard Business Review*, 54: 49-58.
- Murphy, L. B., Moriarty, A. E. 1976. *Vulnerability, coping, and growth*. New Haven: Yale University Press.

- Perrewé, P. L., & Zellars, K. L. 1999. An examination of attributions and emotions in the transactional approach to the organizational stress process. *Journal of Organizational Behavior*, 20: 739-752.
- Perrow, C. 1986. *Complex organizations: A critical essay* (3rd ed.). New York: Newbery Award Records.
- Prietula, M. J., & Simon, H. A. 1989. The experts in your midst. *Harvard Business Review*, January-February: 120-124.
- Pitcher, P. 1999. Artists, craftsmen, and technocrats. *Training and Development*, 53: 30-33.
- Polanyi, M. 1966. *The tacit dimension*. Garden City, NY: Anchor Books.
- Reger, R. K., & Palmer, T. B. 1996. Managerial categorization of competitors: Using old maps to navigate new environments. *Organization Science*, 7(1): 22-39.
- Popper, K. R. 1963. *Conjectures and refutations: The growth of scientific knowledge*. London: Routledge.
- Rotter, J. B. 1966. Generalized expectancies for internal versus external control of reinforcement. *Psychological Monographs: General and Applied*, 80: 609.
- Rotter, J. B. 1971. External control and internal control. *Psychology Today*, June: 37-42; 58-59.
- Rotter, J. B. 1990. Internal versus external control of reinforcement: A case history of a variable. *American Psychologist*, 45 (4): 489-493.
- Salovey, P., & Mayer, J. D. 1990. Emotional intelligence. *Imagination, Cognition and Personality*, 9: 185-211.
- Simon, H. A. 1957. *Administrative behavior* (2nd ed.). New York: Free Press.
- Simon, H. A. 1977. *The new science of management decision*. Englewood Cliffs, NJ: Prentice-Hall.

- Simon, H. A. 1978. Rationality as process and as product of thought. *American Economic Association*, 68(2): 1-17.
- Simon, H. A. 1979. Rational decision making in organizations. *The American Economic Review*, 69(4): 493-513.
- Simon, H. A. 1982. *Models of bounded rationality: Volume 2. Behavioral economics and business organization*. Cambridge, MA: MIT Press.
- Simon, H. A. 1987. Making management decisions: The role of intuition and emotion. *Academy of Management Executive*, 1: 57-64.
- Staw, B., Meckechnic, P., & Puffer, S. 1983. The justification of organizational performance. *Administrative Science Quarterly*, 28: 582-600.
- Taylor, F. W. 1911. *Principles of scientific management*. Easton, PA: Hive Publication Company
- Tesolin, A. L. 2000. How to develop the habit of intuition. *Training and Development*, 54(3): 76.
- Trevino, L. K. 1986. Ethical decision making in organizations: A person-situation interactionist model. *Academy of Management Review*, 11(3): 601-617.
- Tversky, A., & Kahneman, D. 1974. Judgment under uncertainty: Heuristics and biases. *Science*, 185: 1124-31.
- Tversky, A., & Koehler, D. J. 1994. Support theory: A nonextensional representation of subjective probability. *Psychological Review*, 101(4): 547-567.
- Tversky, A., & Kahneman, D. (Eds.) 2000. *Choices, values, and frames*. New York: Cambridge University Press.

- Ubel, P. A. & Loewenstein, G. 1997. The role of decision analysis in informed consent: Choosing between intuition and systematicity. *Social Science and Medicine*, 44(5): 647-656.
- Wagner, R. K, Sujan, H., Sujan, M., Rashotte, C. A., & Sternberg, R. J. 1999. Tacit knowledge in sales. In R. J. Sternberg & J. A. Horvath (Eds.), *Tacit knowledge in professional practice: Researcher and practitioner perspectives*: 155-182. Mahwah, NJ: Lawrence Erlbaum Associates.
- Walsh, J. P. 1995. Managerial and organizational cognition: Notes from a trip down memory lane. *Organization Science*, 6(3): 280-321.
- Watling, C. P. 1998. The arts, emotion, and current research in neuroscience. *Mosaic*, 31(1): 107-124.
- Weick, K. 1979. *The social psychology of organizing* (2nd ed.). Reading, MA: Addison-Wesley.
- Weick, K. E. 1990. The vulnerable system: An analysis of the Tenerife air disaster. *Journal of Management*, 16(3): 571-593.
- Webster's Third New International Dictionary of the English Language Unabridged* 1976. Springfield, MA: G. & C. Merriam Co.

FIGURE 1
Executive Decision Making Under Crisis

